

**Twenty-Ninth Transit Construction Roundtable
Renaissance Cleveland Hotel
Cleveland, Ohio
April 27-29, 2008**

Monday, April 28, 2008

Welcome and Introduction

Susan Schruth, FTA Associate Administrator, kicked off the 29th FTA Transit Construction Roundtable meeting in Cleveland, Ohio, thanking grantees for coming to Cleveland to discuss challenges in constructing major capital transit projects and to share lessons learned from those experiences.

The agency, she explained, is in the last leg of an 8-year administration, and will be in a state of flux until after the presidential election, when a new administrator is appointed. What's going on now? New Starts funding, she said, will run out soon unless SAFETEA-LU is reauthorized. PMO contracts will also expire at the beginning of next year. Schruth said RFPs will be going out in June 2008 and the agency hopes to award contracts to 20 firms. In the meantime, PMOs handling higher risk projects may be asked to stay on.

In other matters, she reported that FTA applied to be winner of the Baldwin Award of Excellence, given to organizations which show continuous improvement in management. The agency also asked 30 younger people, "future leaders," to draft a new mission or strategic plan that reflects their ideas of what FTA should be doing to serve the public's transit needs.

FTA had also set aside funding to host a meeting to address existing infrastructure challenges. Five to 10 of the oldest, largest transit agencies will be asked to meet in Washington D.C., this summer to talk about how to bring their respective systems up to a state-of-good repair.

In conclusion, Schruth said that Americans are tired to spending so much money at the pump—and they are finally turning to public transit as a solution. FTA needs to step up to the plate to serve their needs.

Opening Remarks

Severn Miller, Chief Counsel, FTA, said DOT will probably need nearly \$22 billion a year to improve the condition and operation of the nation's transit system through 2024—70% higher than all transit capital spending in 2004. Predicting the cost of complex transit capital projects will be harder as commodity costs for steel, aluminum, concrete and oil keep rising. The

Highway Trust Fund—a traditional source for transit funding--is expected to run a \$3 billion deficit before the end of the new year.

FTA, he said, is conducting Public-Private Partnership Roundtables with selected New Starts grantees to encourage public-private partnership. These will be held in Houston, Denver and Oakland California. The FY09 proposed budget seeks \$10.1 billion for the New Starts program, additional funding for urban formula and rail modernization grants, and funding to help rural areas develop transit.

The budget also proposed funding for 9 new Small Starts program and 4 existing Small Starts project in cities around the country.

Around-the-Table Discussion

Anthony Zakel, Office of Engineering, FTA, then asked members to go around the room to introduce themselves and provide updates of their properties' activities. Zakel moderated the discussion.

Greg Thorpe, Utah Transit Authority, said the agency awarded a design build contract to a consultant for the construction of the 70 mile light rail development project. The contract agreement includes a 3% incentive bonus to encourage contractors to meet milestones or finish ahead of schedule. Thorpe said he hopes the bonus will motivate contractors to “do whatever they can to have fewer change orders.”

Connie Crawford, MTA New York City Transit, explained that last summer's rainstorm inundated the sewage system, and filled the stations with debris and dirt, forcing many lines to shut down stations until the tracks were cleared. The Governor asked MTA to come up with a flood prevention plan within a month-Crawford's department was asked to explain what happened and identify solutions. The agency's communication system also failed to meet expectation during the emergency. Crawford said MTA is conducting a 100 year study to look at global warming, lack of drainage areas and other challenges —and come up with long term solutions. Crawford hopes to learn more about public/private partnerships during the meeting.

Mark Rolfe, Connecticut Dept. of Transportation Northeast, said the 9.4 mile long BRT project has completed 50%-60% of design. The southern half of the line will operate in a corridor purchased by the transportation department 15 years ago. The property will be sharing the rail in the northern section with Amtrak. The project was locked in at 30% design, threatening its New Starts rating and delaying entry into final design. Rolfe said his staff is

working with the region to better manage costs. The project is high profile, as the public clamors for public transit.

Tim McKay, Dallas Area Rapid Transit, proudly announced that his agency's safety record placed them under 10% of the national average for workers comp and general liability—a standing that may in the long run save them money. McKay reported on the status of several projects including the transition to a level boarding program, (two of four platforms have already been raised) and participation in a pilot program on fixed and mobile security systems. McKay would like more information on intelligent camera systems. **(Around the Table Discussion: DART Expansion Plans.)**

Quentin Brathwaite, World Trade Center Construction Dept., explained that his office is responsible for overall program management for the Downtown Restoration Program. The project is half way through final design. Brathwaite said he is working closely with FTA and the PMO to prioritize the schedule. He wants to know: How do you maintain engineering design of a signature architect in such a complex construction and security-driven environment? He said the CMGC contractor is not committed to the project's entire schedule; so much of the work is being done on a day-to-day basis.

Corey Hill, Virginia Department of Rail and Public Transportation, said his agency provides financial and technical assistance to operators-but it is not involved in construction or operations. Updates: The heavy rail project is seeking FTA approval to enter final design. The light rail project, managed by Hampton Road Transit, is under construction. Several communities are looking at bus rapid transit projects. Hill believes operations staff should be brought into the FFGA approval process earlier on to avoid having to issue change orders during construction. Hill would like feedback on integrating operations into the project development process.

Mark Robinson, Santa Clara Valley Transportation Authority, said they are “into a lot of engineering but not much construction.” Robinson said overall ridership is up, farebox revenue is up, the agency build up its reserves and it is investing 10% of its budget every year to bring the system into a state of readiness. The 6-mile extension project is wrapping up at 65%, and the administrative draft will be submitted to FTA within a month. The biggest challenge he is facing with the BART project is “impressing folks we will have the financial wherewithal” to operate and maintain the system when it goes into operations ten years from now. “As healthy as we are,” he said, “we can't show that right now.” The transit property needs to find another revenue source. **(Around the Table Discussion: Santa Clara Valley Transportation Authority.)**

John Grosso, Southeastern Pennsylvania Transportation said his team developed guidelines on working with contractors, stressing the importance of “making the contractor whole” by reimbursing them for actual delay costs incurred during the late period. “We try to base everything on actual cost,” he said, rather than paying for profit or mark ups. The process starts with conducting a Time Impact Analysis (TIA), a procedure used to let the contractor off the hook when the project is delayed through no fault of their own. **(Around the Table Discussion: Southeastern Pennsylvania Transportation Authority.)**

Shawn Kildare, MTA Capital Construction Company, said the four mega projects FTA has funded through FFGAs—some of which include East Side Access, Second Avenue Subway Project—are “deep into construction.” A city-funded project is also under construction. Last year, the agency awarded more than \$1.5 billion in contracts through negotiated procurements. Biggest challenge: attracting and maintaining engineers and construction professionals. PMOs are facing shortages of manpower as well.

Malka Rodriguez, Miami-Dade Transit, said the agency is adding a third leg to its existing heavy rail system. The city has grown steadily, and so has the congestion. The project is financed with local funding from sales tax, and will be developed 100% in-house. The property is still dealing with right-of-way issues and utilities. She worries that working with so many different agencies may impact scheduling. **(Around the Table Discussion: Miami-Dade Transit)**

James Sumoski, Miami-Dade Transit, is completing Phase II of the 6.5 miles leg of the bus way extension. Segment one was completed over two years ago. **Lessons Learned:** The agency got complaints that the 1.4 miles gap between shelters—allowable under the guidelines—is too wide. People don’t want to walk that far. **Another Lessons Learned:** Work with the public works department whenever possible.

Brian Buchanan, Valley Metro Rail, said the property is 86% complete on a New Start 20-mile light rail project, slated to open Dec. 27 on schedule, and it has just finished guideway construction. The agency is also 65% complete with the design of a 3.2 mile extension, with construction slated to begin at the end of the year. Three extensions are also in AA. Buchanan said he anticipates the governor to come out with a sales tax initiative for the November ballot. The amount allotted to light rail will be split among the metropolitan areas of Tucson and city of Phoenix. **(Around the Table Discussion: Valley Metro Rail.)**

Richard Shay, Metropolitan Atlanta Rapid Transit Authority, said their greatest concern is the transit system's aging infrastructure. The system is in dire need of repair. Their funding comes from local sales tax, but fewer funds are available because of the weakened economy. The agency is updating electrical systems, finishing up fare collection systems and rehabilitation of 220 rail cars. They are also working on improving their communication system and developing safety and security plans.

Diane Nakano, Sacramento Regional Transit District, said the agency is building a 4.3 mile extension to the existing 38 mile system, but the Sacramento Fish and Wildlife Service was taking too long to approve the transit's biological assessment-until FTA and DOT intervened. Nakano said the agency was being pressured to resolve flood control issues and wanted to know if other grantees were getting the "Katrina card" played on them. She also asked whether any west coast properties would be interested in helping her agency initiate value engineering. "We could bring you in so you could see our system," she said, "then send you out with plans and specs and you can come back to meet with us with your feedback. **(Around the Table Discussion: Sacramento Regional Transit District.)**

Frank O'Dea, Florida Department of Transportation, said the agency is awaiting legislative approval for purchasing 61 mile of existing rail tracks from CSX. The 31-mile Phase 1 segment of the commuter rail project, which includes 18 miles of double tracking, will serve 12 stations. Phase II would serve 5 additional stations. Service is expected to begin in 2011. O'Dea said that three firms are shortlisted to prepare the technical proposal for Phase 1. Technical proposals are required when doing best value procurement. **(Around the Table Discussion: Central Florida Commuter Rail Project Scope.)**

Daniel Mazza, South Florida Regional Transportation, said the agency finally finished the double tracking project. Ridership is increasing, but resources are not. Mazza worries about the financial stability of his agency. If one county cuts back on its contribution, others may do the same, creating a "house of cards" scenario. DOT has an existing funding source, a \$2 rental car fee per day, but Mazza said going after those funds would "pit us directly" against DOT. Mazza said he would like to see a Lessons Learned on how grantees can maintain their own tracks and signals.

Winston Simmonds, Port Authority of Alleghany County, said the North Shore Connector project will extend the agency's light rail system from an underground station through the river to the North Shore. Development around the area has been growing as business, hotels, restaurants, even a casino, set up shot to support the revitalized downtown area. Challenges: The agency is seeing "abnormal escalations" due to commodity increases, the system is old and in

need of repair. The agency is embarking on an innovative project by asking community members what type of service they want--and documenting their answers in a scorecard developed 18 months ago to cut service.

Tom DeMaria, MTA Long Island Rail Road, said the recent estimate for his project is \$1.4 billion—way above the cost estimates five years ago when the project was launched. Updates: The agency completed the EIS for the mainline corridor project, third track east of Jamaica, and submitted it to FTA. They are also implementing a life cycle maintenance program, and moving forth on its ventilation project.

Joseph Gildner, Sound Transit, said the agency is finishing one of its first major plans—the Sound Move Plan---which involves construction of transit projects and over 100 miles of HOV. Closeout has been a struggle because contractors are not motivated to go through the items identified in the punch list. The agency is also reaching out to contractors in the community to keep them in mind for future capital projects. **Lessons Learned:** get management consultants involved earlier on in the process to help with bids and constructability reviews. (**Around the Table Discussion: Sound Transit.**)

K.N Murthy, Los Angeles County Metropolitan Transportation Authority, said the agency just received the Board's approval to seek a public/private partnerships to fund these project. He said the light rail project is 85% complete and scheduled to open soon. The BRT line is among the most successful in the country, exceeding ridership expectations. The property is encouraging its funding partners to look at sustainability more seriously, reduce carbon footprint and improve air quality.

Eric Olson, Exposition Metro Line Construction Authority, said the agency was established independently by the California legislature to develop over 20 miles of light rail system extending from downtown LA to Santa Monica-and then turn it over to Metro for operations. The project is broken down into two phases. The first phase is under construction, and the second is undergoing AA. Challenges: The design is 85% complete, but they've only finished 10% of the construction the system is scheduled for revenue operation in July 2010.

Chris Weyer, Metro Transit, said that the 47 mile segment of commuter rail NorthStar will start revenue operations in late 2009. The new Minnesota Twins Ballpark is being built adjacent to Northstar's downtown construction site, creating safety hazards and congestion. Weyer said

the agency's contractor is working closely with the ballpark's contractor to ensure safety. He also said five major contracts have been awarded under the FFGA grant,

Lee Roy Padgett, Hampton Roads Transit, said the agency just received an additional \$19 million from FTA for the construction of the light rail project, the first major one in the Hampton Roads area. The initial line will run 7.4 miles—three miles downtown and the other four along the former Norfolk Southern right of way. **Lessons Learned:** Start planning for utility relocations and right-of-way permission at least a year in advance.

Rich Rovang, Metro Transit, Metropolitan Council of Twin Cities, said the legislature passed a quarter cent sales tax last year for the five county metro areas and they hope to get funding through that soon. The university is not “tickled” about the transit authority building the Central Corridor LRT line, because of concerns they have about interference with electromagnetic field. A big part of the job is managing the university's expectations. They tried to develop scope definition early on and involve risk management. They have a matrix of 27 key issues associated with risk and are trying to manage them through the early PE process.

Dan Blocher, Tri-County Metropolitan Transportation (TriMet), said the agency is working on two FFGA projects. Westwide Express Service, a 14.7 mile new Commuter Rail service which includes 5 stations and four new Diesel Multiple Unit railcars, is 80% complete and service is expected to start this October. They ended up using a lot of contingency up front and fell short of the amount needed to manage problems during construction. The agency is 50% complete on the Portland Mall Light Rail Project, an 8.3 mile expansion of the existing MAX light rail system. **(Around the Table Discussion: TriMet.)**

Michael Sullivan, MTA, said they were still committed to constructing 5 BRT lines, launching one route in each of the city's boroughs. The fees generated from the congestion charge are expected to support BRTs.

Steve Santoro, New Jersey, said the agency is working with Region 2 on a risk assessment for the \$7.6 billion project, construction of the Trans-Hudson Express Rail Tunnel. The PMO is doing a “fairly decent job” in coordinating activities and allowing them to respond to their initial assessment. Santoro is concerned that if they adopt FTA's model for determining fleet size, rather than its own, the agency won't have enough vehicles to handle capacity by 2010. He would like to know how to expand core capacity without adding track.

John Funghi, San Francisco Municipal Transportation, said the Central Subway project, a critical transportation improvement, is the second phase of the Third St., Light Rail project. It involves 1.7 mile extension. They submitted the final environmental document to Region 9 and they are anticipating a record of decision in September. His major concern is commodity escalation

Henry Stopplecamp, Regional Transportation District, announced that construction on the west corridor and utility relocations have begun. The original costs of building the 119- mile commuter and light rail project was estimated at \$4.5 billion, but it increased as the price of commodities went up. **Lessons learned:** When you put together a baseline budget for corridors base it on schedule because the EIS process can take longer than planned. The best thing to do: build it right the first time, take care of the utilities and acquire right of way early on.

Steve Silva, Maryland Transit Agency, said their metro system was built 25 years ago, and is in need of repair. The legislature increased sales tax from 5% to 6%, and his agency gets half of those funds, the rest go to highway fund. They expect to get a billion over five years—an unprecedented amount for that type of split. Commuter rail is growing by leaps and bounds. The agency developed a MARC growth and investment plan in five year increments until 2035. Silva was told to ensure bus facilities and maintenance shops in early design have the Leadership in Energy and Environmental Design (LEED) Certification. “We have no defined policy,” he said. He told the group he’d like to talk to anybody who is working with green building initiatives.

Simon Zweighaft, Honolulu High Capacity Transit Corridor Project, said the agency is anticipating approval to enter into PE in the 20-mile elevated rail transit system. The funding split is expected to be 75% local and 25% federal and the city expects to begin construction right away following clearance of the EIS and final ROD. The total work contracted by the city ahead of the FFGA could amount to something between \$600 million and \$1.2 billion, or as much as 50% of the total project cost. ([Around the Table Discussion: Honolulu High Capacity Transit Corridor Project.](#))

[Introduction to the Construction Tour](#)

Presented by Joe Shaffer, ECTP/Deputy Project Manager, GCRT

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Grantee Methodologies for Managing Consultant Contractors

Glenn Zika, CTA, said his agency goes through a rigorous consultant selection process led by the purchasing department, which appoints three CTA employees to sit on an evaluation committee. Zika then submits a document to that department with project specifications, including scope and estimated labor hours. Every committee member evaluates each consultant independently and renders a decision. (**Managing Consultants Presentation, Glenn Zika, CTA**)

If the candidates rate too closely, the purchasing department asks the consultants to come back the next day to make a 10-minute oral presentation before a selection committee, clarifying seven points made at the original meeting. “We do that because we don’t want to sit through another long presentation,” Zika said. “We also want to see how fast a consultant can react to a last minute demand.”

The selection process takes on average 6 months, but can be accelerated under emergencies. Zika said he’d rather write up a task order and turn over the contract to a consultant already onboard. But he has to hire additional consultants to handle large capital program projects. Evaluations, he said, are handled systematically as well. When a problem pops up with a design, Zika reviews the drawings. “It falls on me to determine whether it is an error or an omission.”

Most of the errors are related to building code violations, but consultants are generally not blamed for mishaps because compliance determinations are left to inspectors’ judgment, which vary depending on the inspector. “We end up doing lots of change orders,” he said. When the error costs the agency over \$5,000, the purchasing department asks the consultant to come in and work out a deal. Most of the time, an agreement is negotiated. One time, a consultant’s error cost the agency over a million dollars. The consultant’s insurance covered part of the payment.

Contractors are conscientious about their jobs during the design process, he added, but tend to slack off when the project goes into construction, missing deadlines for requests for RFI submittals.

Have any consultants accused the agency of favoritism? Zika said nobody has claimed they were unjustly judged, and I think that’s because the process is inherently fair. “We try to

keep it clean,” he said. The purchasing department is so determined to keep the process independent that it even rejected the board members’ request for access to evaluation records.

Who sits in the committee? The members rotate. Usually the project manager is one of the committee members, and the general manger from purchasing is another.

What happens if the consultants can’t come in for the oral presentation on such short notice? Zika said they “downgrade” consultants who can’t make last minute meetings. “We figured they must not want the job.” The agency used to give consultants two day notice to come before the selection committee, but they wanted to avoid sitting through canned presentations. They now ask consultants to return the next day, catching them off guard to see how they fare.

The agency does not tell other consultants that they lost the bid in case negotiations fall through with the selected bidder, in which case the next bidder with the highest score gets a shot at the job. “We don’t tell anybody,” he says. “They get to hear the news at our board meeting.”

John Funghi, SFMTA, said his agency evaluates candidates based on qualification, not price, and awards the contract to the most qualified bidder with the best price. Before issuing the proposal, they do a cost analysis--an independent estimate of how long it will take to get the job done and projected costs of overhead and materials. Negotiation focuses on hours and tasks, and payments are based on what percentage of the task is completed. The agency will negotiate profits but it prohibits cost plus percentage of cost. **(SFMTA Consultant Contracting Procedures, John Funghi, and SFMTA, Central Subway, John Funghi, SFMTA)**

San Francisco engineers, he says, are unionized and it’s not easy to get approval from the Civil Service Commission to procure services outside the city family. Nonetheless SFMTA has to hire consultants to support a line extension. The agency is self-certified and has the technical capacity to comply with federal procurement requirements. But Funghi said he finds the self-certification process onerous and would rather have FTA audit them “since our group has a tendency to go over the top in terms of certification.”

He then described how to manage consultants. A good relationship with consultants is key to the project’s success. His advice: avoid placing blame, listen to the other party, work on what you can agree on, and agree on how to check to see if the solution is working.

What kinds of challenges have you faced in working with unions? Funghi said one way to get civil service approval is through the staff augmentation process, which involves a consultant coming in and working hand in hand with MPA design staff. This scenario is “a bit problematic from the liability and coordination standpoint.” They negotiate the work scope with the union and divvy up the work before the proposal goes out to bid. His agency is also obligated to put out consultant selection reports.

Whose software do you use? His agency is flexible and is willing to buy the consultant's software program if it is a better product than their own. Some employees are trained to learn the program and then share that knowledge with MTA staff and consultants. The agency invests heavily in technology, but that's a must. "The headache with technology though is upgrades and compatibility," he said.

Steve Silva, Maryland MTA, presented an overview of the agency's growth, which started out doing a few large projects for new rail systems and is now developing a few hundred capital projects that include systems preservation, construction next to active rail lines and expansion of commuter rail and bus service. About seven years ago, he said, MTA created a separate quality assurance division responsible for all design and construction and with direct report to chief engineer. A new Quality Assurance Program Management Plan (QPM) was released last year requiring, in part, that each design consultant develop and maintain a QMP specific to each assigned project. Initial resistance from the consulting community and MTA project managers was eventually overcome. **(Quality Assurance in Project Design & Lessons Taught, MTA, Steve Silva.)**

Silva then described how QPM works. The agency assigns an interdisciplinary team to review every phase of one project and to produce a Lessons Learned white paper so others can learn from its experience. MTA is beginning to develop a database generated through Lessons Learned from the past. MTA's goal:

- To develop a Lesson Template for each Lesson Learned and input the information into a new Database.
- To require project managers, designers and quality assurance staff to access the Database for any new projects assigned.
- To sort out database by engineering, and other types of projects.

Do you reach out to the contracting community? Silva said they meet mostly with the Maryland minority contractors groups interested in responding to bids. His agency does, however, offer de-briefing meetings with consultants who did not win the bids and who want feedback on their proposal. Consultants reported they really appreciate these meetings, especially since many agencies don't offer them. The agency relies heavily on outside contractors. Other than designing a bus shelter and other small projects, most of the design work is done by consultants.

Do you try to encourage contractors to take on more risk? One participant said that during contract negotiations consultant designers often come up with innovative cost-savings ideas. "At one meeting," said Silva, "I told the contractor, 'we'll give you an additional fee if you can do this (project proposed) and then put your fee at risk if it doesn't happen.' But they are reluctant to agree to that." One time, his agency said it would nearly double its consultants' fee if

they took on more risk and cut their fee by only 50% if their idea didn't work out. But it was a no go.

Another participant warned grantees about offering incentive fees if they share risks. But his agency was always fighting with consultants about whether they are entitled to get the fee. The bottom line, he said, is that consultants don't want to put themselves in a vulnerable position.

One transit agency representative his agency requires that 2/3 of the incentive fees go to the local staff, not the company—a successful approach.

Risk Assessment Discussion (FTA Technical Reviews)

Tony Zakel, FTA, presented an overview of the risk assessment program. Out of the 13 “First Generation” risk assessment workshop, which started out in 2002 with Seattle’s Central Link LRT Project, only one stayed within the 90th percentile forecast for budget and schedule. The “Second Generation” projects are faring much better, he said. Risk assessments have been performed on 14 New Starts projects, and all of them have come within 5% of cost estimates. **(FTA Risk-Informed PM Oversight Status, FTA, Tony Zakel.)**

FTA, he reported, is in the process of updating documents to reflect new improvements to its Risk-Informed PMO program. These documents include:

- The 1989 Final PMO Rule
- Circular 5010, Grants Management Guidelines
- Circular 5200, FFGA Guidelines
- 2003 Project and Construction Management Guidelines.

Lessons Learned to date from both risk assessment generations:

- Grantees must pay closer attention to escalation rates and YOY calculations than they had in the past.
- Contract terms and conditions have had a strong influence on contractor pricing.
- In some cases, cost estimates are not linked to a WBS activity.
- Pricing may be adversely affected by lack of competition.
- Reliability of structures to accommodate the mode of travel has only been assumed and not verified.

- Greatest risk to costs occurs during design and solicitation.

Can grantees do their own risk assessments? Zakel said some grantees are already performing risk assessments on their own, which doesn't preclude FTA from conducting its own risk assessment as well. But the hope is that FTA and the grantee will come up with similar findings. "At the end of the day," he said, "all we want to do is make sure there is a solid scope and schedule and if we both agree, that's a good thing." He also noted that the program management plan should be used to actually manage projects.

Over the past year and a half, FTA has also been conducting 30-day risk assessment reviews pre-PE for projects under a billion. These reviews are less rigorous than those required for larger projects. He clarified that in general FTA does not complete its risk assessment until the environmental Record of Decisions (ROD) is issued. You can start portions of the risk assessment prior to the ROD, but the ROD says you have to have defined scope.

What's the difference between the project implementation plan workshop and project execution plan workshop? The project implementation plan workshop defines how agencies will implement the project during the design phase, Zakel explained. The execution plan workshops spells out how agencies will carry out risk mitigation strategies in the late stages of design, solicitation phase and construction.

How flexible is FTA in adjusting appropriate contingency amounts? Contingency, he said, is determined by the project's complexity and the grantee's experience. FTA would be more amenable to lowering the contingency number on a project involving an ungraded railroad or BRT than on one involving tunnel construction because there is less risk involved. If Utah wants to build another light rail project, for instance, FTA may go into a risk assessment and say, 'you guys know what you're doing.' "We try to bring in a common sense perspective," he says. But sometimes agencies get carried away in early design and don't think through the project. Even experienced grantees are thrown off by unpredictable events that can derail the process and delay completion.

Gildner said his agency has benefitted from the execution workshops in 2006 and 2007, but he is concerned that delays in FFGA approvals will limit the agency's options of light rail vehicle purchases and jeopardize relationships with construction contractors. "We are not done yet in terms of trying to nail down the exactness of what they (FTA) would like us to do with some of the contingencies," he says. "We've probably circled the big drivers and now are debating the details," he said.

Does FTA look at the cost of delays? Zakel said that Seattle is an exception to the rule because they are doing the detailed risk assessments during final design, whereas most projects do the assessments during PE (with a refresh in final design), parallel to other design activities. The hope is that the assessment does not add to project schedule delays.

Schruth said FTA needs to ensure it is placing reasonable demands on the grantees. But grantees who think FTA is trying too hard to find the perfect solution to managing risks should talk to the regional administrator about their concerns. “Don’t be afraid to say, ‘We think you’ve gone as far as you can since this is a cutting edge process.’”

Can regions be more flexible in terms of meeting benchmarks? Zakel said that FTA is focused on helping grantees obtain FFGA approval by ensuring they develop a mitigation strategy and assign contingency. But it’s up to the grantee to manage the projects, including solicitation for contracts. Schruth said FTA rarely looks at contractors’ bids but wanted to in a few cases because they were coming in 20% to 40% higher than engineer’s estimates.

Schruth added that she was more optimistic that engineers’ cost estimates will now more closely resemble Independent Cost Estimates. “For a couple of years after Katrina,” she said, “everybody was surprised at the big escalation, and the engineer’s estimates were way off,” Hopefully, she said, the gap between the two estimates will narrow as engineers consider current market conditions.

Shawn Kildare, MTA Capital Construction, said he prefers negotiated procurement methods for selecting consultants because they create an environment in which contractors can suggest cost saving ideas that would never otherwise come up in a traditional “design-bid-build” procurement process. Another benefit to this method is that contractors can negotiate specific “terms and conditions” and raise concerns over risks. Negotiated procurements work best, he said, when there is minimal third party influence and when the owner knows what should be build and has at least completed PE.

Disadvantages: negotiated procurements often lengthen the contract award process, and may require additional policy changes and engineering services. Agencies can negotiate procurement by using different techniques including alternative design solutions, project schedule mitigation, risk sharing, and re-packaging. Kildare cited examples of how each strategy worked with its transit projects including the South Ferry Terminal Project and East Side Access. **(Strategies for Negotiated Procurements, MTA Capital Construction, Shawn Kildare.)**

Gregory Thorpe, Utah Transit Authority, added that he found the risk assessment process helpful. The characterization workshop was especially beneficial because the design-build contractor who was taking on much of the risk was involved in the meeting. The assessment concluded with a contingency management plan and project execution strategy. Secondary (triggered) mitigation measures were also developed during the pre-final design process so the agency could reduce costs by \$29 million and cut the schedule by 187 days if it ran into additional trouble. **(Risk Assessment, Gregory Thorpe, UTA.)**

The Mid-Jordan LRT Line project is slated for FFGA approval October 2008. His agency developed a Risk Scoring Matrix to keep track of project development. The spreadsheet

lists each project, along with relative risks and mitigation strategies. Pre-PE cost reviews began July 2006, followed by a pre-Final Design risk assessment in August 2007.

Transit Oriented Development (TOD) along BRT Corridors

K Murthy, LA Metro, said the goal of Metro's Joint Development Program is to encourage planning and development around station sites and transit corridors in hopes of reducing congestion and pollution. The joint development program has turned blighted neighborhoods into profitable centers, he said. Example: Hollywood Blvd., previously run down and riddled with social problems, is now a premium corridor for development. The Wilshire/Vermont Metro Red Line's mixed-used development includes 450 residential units, 45,000 square feet of commercial space, a child care center, 800 middle school students and 700 underground parking area. **(Metro Transit Oriented Development: Real Estate Joint Development, LA County MTA, K. Murthy.)**

His advice: If you're going to do TOD, make sure that the developer has control over the property before publicizing the project. "You don't want to have the communities come to you and say, 'Why don't you take this blighted area and develop it for us?'" If the developer doesn't own the property, "make sure you know the audience."

Schruth said land use is one of various criteria FTA uses to assess New Starts project justification. Congress has been asking FTA to quantify the benefits of land use development around the metro stations, but nobody has been able to articulate a compelling answer or provide supportive data. "If you work with a developer who is savvy and can say, 'we decided to invest here because...' let us know so we can at least build a database."

Mary Beth Feke, GCRTA, painted a dismal picture of Cleveland's economic condition. The city's population is shrinking, she said, homebuilders are leaving town or going bankrupt, and there has been little or no economic stimulus from the city or region for transit development in general. Yet, she said, the Euclid corridor has made major progress. She said the playhouse square, four historic theaters and other retail has brought in millions in investment. A university made a conscious effort of relocating activities along Euclid Ave., "The economic conditions don't warrant this type of investment," she said. "The lesson here is that when we create our corridors we must make sure we have strong people to do the development." Hospitals, universities can help sustain and create activity levels even through economic crisis. **(ECTP Transit Oriented Development, Mary Beth Feke.)**

Utility Relocation

Tim McKay, DART, focused his presentation on using Subsurface Utility Engineering (SUE) to manage risks associated with underground utilities. Designers, he said, need to pin

point the location of the utility early on in order to determine whether it is more cost effective to relocate the utility or design around it. Sometimes designers can just make small adjustments in elevations or horizontal locations to avoid relocation. Other times, relocation is unavoidable. Either way, transit agencies will need the cooperation of utility companies to get the project done. (See [Myths or Facts: Challenges for Successful Utility Relocations](#), Timothy H. McKay, P.E. Dallas Area Rapid Transit)

Do you have a policy on when to use SUE services? McKay said his agency makes the decision on a case-by-case basis. Agencies may be required to relocate some lines but prefer to leave others intact. DART, for instance, decided to keep the 90 year old hand-dug storm sewer the crew came across during construction and build a bridge slab over part of it—a \$10 million job. The city suggested that DART rebuild the 2-mile sewage line and pay tens of thousands of dollars out of pocket. McKay urged grantees to look at the “big things you know will have to be moved” and to get it done as early as possible.

How much risk should the contractor be asked to bear? McKay said it’s tempting to ask contractors to take on more risk—but he questions this wisdom. The partnership may sour if something goes wrong with the project’s design and the contractor gets stuck with the bill. On the other hand, transit agencies should be protected as well. McKay said agencies are better off telling contractors everything they know about the project and adding a disclaimer in the contract that says unforeseen circumstances could drive up project costs and delay completion.

The group then discussed problems they’ve encountered with utilities while trying to relocate lines. McKay knew he was in trouble when the construction crew nearly drilled into a utility line that was not identified in the maps. He told the crew to peel back the casing and clip one line to see what happens. Within 20 minutes, a black suburban pulled in filled with government officials demanding to know what’s going on. “They ended up posting 24 hour guard over the crews until that line was encased and covered up,” he said.

After that incident, McKay asked his agency’s homeland security liaison to find out from utilities and other federal agencies if there are any “unofficial” lines buried underground that construction crews should know about. Most properties have a homeland security designated contact. “I would use them to help us find lines in advance because they (utilities) will cooperate” with them.

Another participant said his agency started coordinating utility relocations during the EIS period and pre-PE. His agency’s CEO met with the utility’s top chief to explain the ramifications of relocating utility lines—and make a case for sharing relocation costs. In some cases, his agency has designated a full time employee at the senior level to act as the go-between. It’s better to get feedback from utilities early on about whether the line should be relocated or the agency should design around it.

Brian Buchanan, METRO, said Building Information Modeling (BIM), which has been widely used in vertical construction, is now being used in horizontal construction. BIM is a 3-dimensional computer modeling tool which links a database of project information that radically transforms the way designs are created, communicated and constructed. The 3D model shows all major existing and proposed components. A 4th dimension can be added that ties each component to the construction schedule and a 5th dimension can link each component to construction cost estimates. Under BIM, the model is continuously reviewed for coordination with the integrated project team. BIM can also be used as a tool to educate the public about the work is being done underground so they can see that the crew is not just standing around doing nothing. “It shows them the complexity of what they can’t see,” he adds. **(Building Information Modeling (BIM) Application in Utility Design, Brian Buchanan, METRO.)**

Connie Crawford, New York City Transit, said her agency is going to “go BIM full force” next year, requiring every designer to use this technology for every project. “It’s amazing,” she said, “You get detailed information up to an eighth of an inch in accuracy. You put it in front of a train, run it through a tunnel and get a full graphical 3D representation of what’s out there.” Most of the agency’s project designs are done in-house. Crawford worries that in 5 to 10 years from now she won’t be able to hire an engineer out of school unless the BIM technology is up and running. “That’s what they’ll be learning,” she said, “and nobody will want to work for an antiquated organization that isn’t using it.”

New York City Transit is using BIM in other areas. The agency will invest in startup costs for developing a library of objects that includes power generators, turnstiles, and other equipment. BIM, she said, “informs and improves” every part of the process. She would like to see BIM as a topic at a future roundtable.

Zakel said that rail car contractors have been using BIM since the mid 1990s to identify the undercar vehicle equipment and piping locations. Although the technology has been around for ten years, it is just now starting to be used to find underground utilities.

Evaluation and Wrap-Up of Construction Roundtable

Zakel summarized the main points discussed at the meeting:

- Revenue decrease due to fiscal environment is affecting local share participation.
- Negotiation procurements can lead to better contractual relations and keep projects at engineering estimates.
- Utility notification: Early communication and involvement is key.

- Profits for consultants should stay at the local office.
- How much value is risk assessment adding to the project? Is there a point of diminishing returns? FTA and PMOC need to exercise better judgment on project involvement based on size and complexity of the project.
- Older properties are running down and we can't afford to replace the infrastructure.

Schruth reminded the group that the next two years will be a critical time for transit as the programs are re-evaluated. Where will the money to finance transit come from as the need for public transportation increases? Transit can step up to the plate, although it's not clear how yet. She warned the group to not expect any major decisions to be issued by the federal government over the next year. The government will be in a state of flux as the new administration settles in, and sets up transition teams.

Schruth asked roundtable members to think about topics for future roundtable sessions. She would be interested in pursuing the following topics and wants feedback from the group:

- How to close out projects. FTA can't afford to keep PMOS attached to projects forever, but it doesn't want to let them go in case the project is closed prematurely. When do people think is the best time to close our projects?
- Under what circumstances PMOs should be applied to Small Starts programs and Very Small Start Programs? FTA headquarters has established funding criteria, but national staff is working with the regions to determine whether regional engineers can oversee the projects and, if so, under what conditions.
- Should PMOs get involved in AA? Should regional engineers get involved in AA, traditionally the sphere of planners? Doing risk assessments early on, before PE, is a good idea to avoid risk becoming an issue later on.
- What type of database sharing tool should FTA invest in so grantees can share information about projects?
- How can FTA make sure transit is safe if it has no safety authority?
- Should the reauthorization bill mandate that APTA issue consensus standards?